

Still further aspects of the invention provide apparatus as described above in which the first (or task) queue is processed on a first-in-first out (FIFO) basis. In related aspects, the tasks in that queue can be treated on a priority basis, e.g., with high priority tasks being executed prior to those of lower priority.

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*Conflict Resolution in Event Processing*

Further aspects of the invention provide an improved SAN, e.g. of the type described above, that includes a first element that maintains a first representation of the SAN, and a second element that maintains a second representation of the SAN. The first element generates notifications of events in the SAN, e.g., addition or removal of components or relationships between components. The second element responds to such notifications by accessing the first representation (e.g., via the first element) and updating the second representation.

10 The first element can be, for example, a detection service of the type discussed above. This maintains, according to aspects of the invention, a representation of the SAN comprising a one-deep history of scans received from the agents. The second element conversely can be the aforementioned manager service. It maintains, as noted above, a topological representation of the SAN. In executing tasks and notifications in the queues described above, the service  
15 manager service (or "second element") can access the SAN representation (e.g., scan history) maintained by the detection service.  
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In certain instances, the event notification may prove inconsistent with the topology representation maintained by the manager service, e.g., as where the notification indicates that a relationship has been added between two SAN components and the topology representation does not include one of those components. Or, for example, if the event notification indicates that a component has been added to the SAN and the detection service's representation includes no such component. In some such instances, according to aspects of the invention, the manager service disregards the event notification. In other instances, the manager service instigates a recovery of the topology representation, e.g., by copying all or a portion of detection service representation. In the latter regard, recovery can be targeted to objects representing a specific device (and its relationships with other devices) in connection with which the inconsistency arose or, for example, to objects representing components of the SAN in a region of that device, thereby, speeding the recovery process.

#### *Event Notification with Data*

Still further aspects of the invention provide an improved SAN as described above in which the detection service (or first element) provides data, along with the event notification. That data is preferably sufficient for the manager service (or second element) to update the second representation but, in any event, is at least sufficient to avoid the need for the manager service to access information in the first representation in order to update the second representation. Thus, for example, along with notification of a missing storage device, the discover engine can transmit an identifier of the device and any other information necessary for the manager service to update its SAN topology database without a need to request additional data from the discover engine.

Further aspects of the invention provide a SAN as described above in which the notification and event are contained in an object-oriented programming "object" or other construct suitable for carrying the requisite message between the detection service and manager service.

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A SAN constructed and operated in accord with these aspects of the invention allows for maintenance of a valid topological representation of the SAN in the manager service, without a need to lock the scan representation in the detection service, even where notifications are generated asynchronously with respect to one another and where multiple notifications may be queued for processing. It also avoids the necessity of conflict resolution of the type described above.

#### *Virtual SAN Determination*

15 Still further aspects of the invention provide a storage area network (SAN) in which one or more host digital data processors are coupled to one or more storage devices (e.g., LUNs) by an interconnect, e.g., a fiber channel-based fabric. Switches or switch-like interfaces on the interconnect fabric define zones or regions in which certain hosts can access certain storage devices, but not other storage devices. Thus, for example, a switch in the fabric may effect two  
20 regions: one over which a first host can access a single port on each storage devices A and B; and another over which a second host can two ports on storage device B.